1923 **ICONOSCOPE** **V K Zworykin (USA)**

The combination of electron beam scanning and storage was first proposed and carried into practice by V K Zworykin in 1923—at a time preceding any other electronic pickup system. The target was an aluminium film oxidised on one side, which was photosensitised with cesium vapour and faced a metal grill serving as collector for photoelectronics. The metal side, which served as a signal plate, was scanned by a high-speed electron beam, which penetrated through the oxide layer, forming a temporary conducting path permitting the locally stored charge to flow off through the signal plate.

While the tube as described was capable of transmitting only rudimentary patterns, it became the ancestor of the extended line of storage camera tubes which dominate all phases of television picture transmission. Their common features are electron beam scanning and a picture target with small transverse conductivity capable of storing charge released in response to light.

The first practical storage camera tube was the iconoscope. Here, the picture was projected on a mosaic of photosensitive elements capacitatively coupled to a signal plate. The mosaic was then scanned by a high-velocity beam, restoring the mosaic to a uniform potential and releasing photoelectrically stored charge for forming the picture signal. The secondary-emission ratio was greater than unity, so that the equilibrium potential under the beam was close to that of the electrodes facing the mosaic.

SOURCE: 'Beam-deflection and photo devices' by K Schlesinger and E G Ramberg *Proc. IRE* p 993 (May 1962)

SEE ALSO: V K Zworykin: US Patent No 2141 059 (20 December 1938) filed 29 December 1923

'The Iconoscope—a modern version of the electric eye' by V K Zworykin *Proc. IRE* vol 22, p 16 (January 1934)